

specification and a marked version of the substitute specification showing the changes relative to the previous version of the specification. We have crossed out deletions and underlined additions.

Remarks Regarding Specification Amendments

The specification has been amended to provide a clear and concise description of the invention and the method of manufacturing the invention. Specifically, the invention relates to the tube vice frame assembly which is comprised of a sub-group components in a tattoo machine. The specification has been amended to describe the interaction of the tube vice frame components with the prior art components of a tattoo machine necessary to cooperate with the tube vice frame's operation.

Paragraphs 1-3 have been deleted as they are not applicable.

Paragraphs 4-5.3 have been rearranged for clarity.

Paragraphs 6-6.4 have been amended to more clearly define objects of the invention.

Paragraphs 8.1 - 8.2 have been added to correspond to the two previously unnumbered drawings appearing with Figure 3, now presented as Figures 3 and 4 on separate pages.

Paragraphs 9-30.2 have been substantially revised to present in a clearer format the invention and the components of a tattoo machine which cooperate with the invention.

The paragraphs contain information originally disclosed now reworded for clarity.

Reference numbers have been added for all parts appearing in the drawings, and all parts appearing in the drawings have been referred to in the description.

Amended Drawings

We have amended the drawings to add reference numerals, and to separate the three drawings previously labeled Figure 2/2 onto three separate pages labeled Fig. 2/4, Fig. 3/4 and Fig. 4/4 appearing on Sheet 2/4, Sheet 3/4 and Sheet 4/4 respectively. Please substitute the accompanying drawing Figures 1-4 for the previous drawings. We also enclose drawing Figures 1-4 marked in red to indicate the proposed changes.

Please use Fig. 2 as the representative drawing for the invention.

Amended Claims

Please substitute the accompanying claims numbered 1 to 15 for the previous claim numbered 1. Claim 1 has been amended, and new claims 2-15 have been added.

Remarks Regarding Claim Amendments

Claim 1 has been revised to focus on the novel aspects of a tube vice claimed within a tattoo machine.

Claims 2 - 8 provide additional novel aspects of Claim 1 with additional limitations.

Claims 9 - 11 provide details of the scope of the tube vice frame claimed.

Claim 12 claims a kit format of the tube vice frame comprising a set of individual parts are described in the previous description.

Claims 13-15 claim the method of manufacturing the components described in the original application.

Prior Art

The Examiner has cited references A-F. We submit that in light of the amended specification and claims it will be apparent that the references do not read upon the subject invention. However, we will address the references individually.

Reference A discloses an electric marking device with a relatively large number of moving parts. The method of attaching the needle guide assembly 16 to a plastic block 94 (a segmented frame component) involves a slot 98 in the block 94 and cylindrical bore 99 to receive the upper extension 81 of the needle assembly. A second bore 100 is provided through the bifurcated block 94 to receive a headed screw 101. The screw 101 is tightened to close the bore 99 about the upper extension 81. To install the needle guide assembly, the upper extension 81 must be inserted in the bore 99, and the assembly turned until the key 92 lines up with the key slot 93, then the assembly 16 must be pushed towards the holder 94, which is then tightened on the tubular extension 81 by tightening screw 101 (Reference A column 6 In 15 - 48). Additionally, Reference A suggests an equally complex needle assembly 17 removal process before removing the needle guide

assembly 16. Additionally, the bifurcated plastic block 94 is a weak structural component which is prone to wear due to the rapidly reciprocating needle assembly 17.

In comparison, the subject invention requires relatively fewer parts to attach the tube 20 to the frame 40 of the tattoo machine 100. The subject invention is streamlined without projecting screw heads. The subject invention requires a simple twist and counter-twist of the nut 12 to replace and remove the needle guide assembly. The subject invention is of sturdy construction. The frame 40 is a single metal piece not prone to wear. The subject invention may be easily covered with a plastic bag for sanitary reasons as is the industry standard and the bag will not be torn on unnecessary projections.

Reference B discloses a silicone rubber bushing 64 which surrounds the distal end of the needle 62 to reduce lateral movement of the needle 62.

We submit that reference B is not relevant to the subject invention.

Reference C discloses a device for controlling the dispersing of pigments 48 from a reservoir 40.

In comparison the subject invention relates to apparatus to connect a needle housing assembly to a tattoo machine. We submit therefore that Reference C is not relevant.

Reference D discloses a rotary motor 64 driving a drive shaft 32 in a hollow cylinder rather than a frame. The cylinder is a series of screwed together components including a tip 6, barrel 18 and the reciprocation chamber 40 housing. The drive motor is located in a perpendicular drive housing 56. The barrel components of reference D screw directly together.

In comparison, the subject invention provides a compressible ferrule 10 which engages the tube 20 in secure and smooth interface that avoids crimping or bending the tube. We submit that the substantial difference in design render Reference D not relevant.

Reference E discloses a tattoo machine with a method of attaching the needle housing apparatus or grip 72 by inserting it in a bore in the frame that tightens on the grip 72 when a wing nut 68 is tightened.

In comparison, the subject invention utilizes the streamlined, inline hollow rod 14, compressible ferrule 10 and nut 12 which eliminate the need for projections such as the wing nut which tends to tear the plastic bag used to avoid contamination by blood during tattooing.

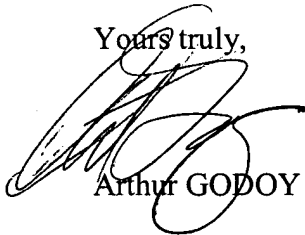
Reference F is directed principally at a means for reducing transverse needle 32 movement. The needle tube 62 is inserted in a circular needle guide portion 12 of the housing 10, and secured by tightening a nut 66 depicted as a wing nut. Reference F

suffers the same disadvantages as the above references employing a split frame bores closed by tightening a screw or nut on a bolt.

In comparison, the subject invention employs a hollow rod 14 with a tapered seating surface adapted to accept the compressible ferrule 10, which is compressed as the nut 12, also with an interior tapered surface adapted to mate against the tapered ferrule 10, thereby applying incremental pressure against the tube 20 around substantially all of the circumference of the tube 20. The prior art does not offer this advantage, an is more likely to result in bending or crimping of the tube 20.

We trust that we have responded fully to all issues raised in the report of July 15, 2002.

Yours truly,



Arthur GODOY



Stephen GODOY

Dated: October 10, 2002.



SCREW TIGHT TUBE VICE FRAME

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BACKGROUND FIELD OF THE INVENTION

[0004]_____ This invention ~~pertains~~ relates generally to the field of tattooing and tattoo machines. More particularly, the invention relates to an apparatus for securing, and is intended to improve the method used to secure the tube grip, which houses the needle bar and needle grouping, to the frame of a tattoo machine frame or intradermal injection device. The tube grip houses the needle bar that holds the needle grouping, which moves into and out of the skin in the act of tattooing.

BACKGROUND OF THE INVENTION

[0005]_____ Tattoo machines necessarily break the skin of the subject during the tattooing process, causing a risk of the spread of infectious diseases such as Hepatitis, HIV and AIDS. The standard in the industry therefore is to sterilize the tattoo machine before each use. Because tattoos must be applied in a sterile manner, In order to effectively and efficiently sterilize a tattoo machine, the components of the machine must be easy to remove, sterilize, and reassemble.

[0005.1]_____ Prior art tattoo machines typically have a needle or needle grouping which extends through the tattoo machine frame and is driven by a motor to reciprocate linearly. A the hollow cylinder or tube is attached to the tattoo machine frame and the needle grouping passes through the tube. A portion of the tube, often having a larger external diameter than the rest of the tube, has a gnarled outer surface. This portion is called a tube grip. The tube grip provides a gripable portion

of the tattoo machine operator and also serves to guide the needle grouping and restrain lateral movement of the needle grouping. The tube grip and needle groupings must be removable to allow them to be cleaned and sterilized. On all modern tattoo machines, the tube grip is a removable part.
[0005.2] Existing tube vice tattoo machine technology uses employs several methods to secure the tube grip to the tattoo machine frame which, but many of these methods tend to bend or crimp the cylindrical tube grip. The present apparatus available not only tend to damage the tube grip, but are slow to remove and reinstall, and apparatus with multiple small screws are difficult to sterilize.

[0005.3] A more recently developed method of attaching the tube to the frame is a split portion of the frame which partially encircles the tube and is tightened with a wing nut. Tattoo machines are covered with a light plastic bag during operation to avoid contamination or cross-contamination between the operator and subject. Not only are such bags often ripped by the protruding wing nut, but the tattoo machine is rendered less streamline by the frame extension, wing nut and bolt required. The wing nut type vice does not apply pressure evenly to the tube grip, and may result in bending or crimping of the tube grip.

~~The Screw Tight Tube Vice Frame (shown in FIG. 2) is designed to allow the tube grip to be secured to the frame with a simple twist and released with a counter twist. The Screw Tight Tube Vice Frame secures the tube grip in place just as securely as or more securely than existing technology, but will not bend or crimp the tube grip.~~

BRIEF SUMMARY OF THE INVENTION

[0006] ~~It is an~~ The object of the Screw Tight Tube Vice Frame present invention is to

provide a secure, easy to assemble and disassemble and streamlined apparatus for attaching -the tube grip and the tube housing needles in a tattoo machine to the frame of the tattoo machine in a manner that improves on the methods currently used-employed by tattoo machines,; while providing a housing for the tattoo machine components.

[0006.1] It is a further object of the invention to provide a The Sscrew Ttight Ttube Vvice Fframe consists of a tube vicecomprising a frame, into which holes are drilled and tapped for attaching the frame to other tattoo machine components, and a tube vice mechanism for attaching the tube grip to the frame. This tube vice mechanism allows the tube grip to be secured to the frame with a simple twist, and released with a counter twist, a compression nut, a compressible ferrule and a receiving piece and a tube adapted such that the tube housing at least one needle may be inserted in the receiving piece, the ferrule slipped over the tube, and the nut slipped over the tube and pushed up against the ferrule, then and screwed onto the receiving piece such that the ferrule is compressed and grips and retains the tube without bending or crimping it.

[0006.2] It is yet a further object of the present invention to provide a tube vice frame that allows rapid and easy removal of the This is important because the tube grip, tube and-with needle groupings is removed often to allow for cleaning and sterilization. and that has It is a further object of the present invention to provide a tattoo machine with a streamlined profile that is easily shrouded in plastic or other material without tube vice frame which may risk of be retrofitted to existing tattoo machines tearing the shroud.

[0006.3] Another object of the present invention is to provide an apparatus for securing a tube grip to be secured to or remaovedremoved from a tattoo machine frame with a simple twist of a nut.

[0006.4] Another object of the present invention is to provide a method for manufacturing a screw tight tube vice frame that is efficient, inexpensive and creates a streamlined, easy to use vice frame on a tattoo machine.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0007] FIG. 1 shows the is a perspective view of a tattoo machine with the a Screw screw Tight tight Tube tube Vice vice Frame frame according to the invention.

[0008] FIG. 2 shows the components of is an exploded perspective view of the key components of the Screw screw Tight tight Tube tube Vice vice Frame frame in detail.

[0008.1] FIG. 3 is a pre-assembly side detail view of a compression nut, ferrule and threaded rod according to the invention.

[0008.2] FIG. 4 is an assembled side detail view of a compression nut, ferrule and threaded rod according to the invention.

DETAILED DESCRIPTION OF THE INVENTION AND PREFERRED EMBODIMENT

[0009] Components Figure 1 depicts the preferred embodiment of the apparatus for attaching a tube 20 and associated components to a frame 40 in a tattoo machine 100 in accordance with the present invention. Tattoo machines 100 are generally comprised of a frame 40, typically made of metal.

Standard frames 40 have a lower binding post 52 and an upper binding post 50. There is also typically a coil mounting bracket 44 at the front portion of the frame 40, and a spring saddle 42 at the lower rear portion of the frame 40. At least one electromagnetic coil 60 is mounted on the coil mounting bracket 44. Preferably there are two coils, a front coil 60 and back coil 62. An armature bar 70 is attached to a spring 69 which extends from the spring saddle 42 and is adapted to reciprocate when AC power is applied to the electromagnetic coils 60 and 62 such that the armature bar 70 is alternately attracted and repelled by the coils 60 and 62, as is known in the art.

[0010] ———[0010] Also as is known in the art, a needle bar 24 is attached to the armature bar 70 and passes through the coil mounting bracket 44 to maintain stability. The needle bar 24 has at least one needle attached to the needle bar tip (not shown). A hollow housing or tube 20 is placed over the needle bar 24 to guide the reciprocating needle bar 24. The present invention relates generally to an apparatus for securing the tube 20 to the frame 40 of a tattoo machine 100, referred to herein as The Screw-screw Tight-tight Tube-tube Vice-vice Frame-frame 30.

[0010.1] Still referring to Figure 1, aA consists of a tube-vice frame and a tube-vice mechanism, which attaches a tube grip of standard industry measurement to the frame. The tube-vice mechanism may include a removable hollow threaded rod 22 14 extends from the mounting bracket 44 towards the active end- or front of the tattoo machine 100. The tube 20 is inserted into the hollow rod ¹⁴22. A house the-compression ferrule (not shown) comprising a hollow split ring with bevelled edges is slipped over the tube 20 to abut the inner surface of the hollow rod 2214. A compression nut 12 with an internal taper is then slipped over the tube 20 to abut and surround the ferrule (not shown) and screw onto the rod 22 thereby securing the tube 20 to the frame 40. , or the hollow threaded section that houses the compression ferrule may be cast or machined as part of the

frame. The tube vice mechanism also includes a compression nut that is tightened around the compression ferrule to secure the tube grip to the frame, and loosened to release it from the frame. The specifications for the threaded rod and compression ferrule are as follows:

[0011] ~~{0011}~~ A tube grip 16 consisting of a hollow cylinder with a gnarled outer surface, which is a known tattoo machine component, is slipped over the tube 20; the tube grip 16 may also be an integral component of the tube ²⁰26. A tube tip 18 is then inserted in the open end of the tube grip 16. At least one set screw 24 26 is screwed through the tube grip 16 and into the tube 20 and tube tip 18, thereby connecting the tube tip 18, tube 20, and tube grip 16 as a unit.

[0011.1]——Referring now to Figure 2, an exploded perspective view of the key components of the screw tight tube vice frame are shown in detail. The tube vice mechanism, which is used to attach a tube grip of standard industry measurement to the frame, is located on the front lower portion of the frame. The frame 40 is shown fully exposed without the additional tattoo machine 100 components. The lower binding post hole 46 and upper binding post hole 48 are shown. In the preferred embodiment the hollow cylinder or rod 14 is removable from the frame 40. The inside surface of the rod 14 is tapered at both ends from a wider diameter at the ends to a smaller internal diameter at the end of the taper.

NM { [0011.2]——The compression ferrule 10 is a split ring or hollow cylinder preferably composed of a malleable material metal such as brass. The ferrule 10 is tapered from each end to a central high point about the mid circumference of the ferrule 10. The ferrule 10 compresses as pressure is applied to the tapered ends such that the internal diameter of the ferrule 10 is reduced and the split or gap gradually reduced. The tapered ends of the ferrule 10 are preferable machined to the same angle

as the taper on the interior surface of the rod 14, such that a mirrored mating surface is created between the ferrule 10 and rod 14.

[0011.3]—The ferrule 10 is compressed between the rod 14 and the compression nut 12, which is a nut having interior threads matching those on the exterior surface of the rod 14, and preferably has a gnarled or otherwise textured exterior surface to provide a grip to the operator. The nut 12 also has an internal taper matching or mirroring that of the ferrule 10. The compression nut 12 is rotated in a clockwise direction to compress and lock the ferrule 10 in place.

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[0011.4]—Optimally, the threaded rod 14 is between approximately 1/2" to 5/8" in length and has a: approximately 1/2" to 5/8" long, with 1/2 20 threading, with an; the inside diameter of the hollow centre measures {fraction (either 5/16)}" or {fraction (11/64)}".

[0012]—The compression ferrule 10 is optimally: usually measures 1/4" tall in length, with an inside diameter of {fraction (5/16)}" in an uncompressed state. The compression nut 12 must be sized to screw onto the rod 14.

[0013] Manufacturing and Assembly

NM
[0014]—The Screw-screw Tight-tight Tube-tube Vice-vice Frame-frame components may be made-manufactured from of metal (such as aluminum, brass, steel, or iron) or any other rigid material (such as plastic, fibreglassfiberglass, or lexan). Preferably a malleable metal such as brass is used. Holes are drilled in the tube vice frame 40 as follows:- a hole for the upper binding post, a hole for the lower binder post, two holes drilled in the coil mounting bracket to accept the screws 64 that secure the coils 60 and 62 and a

drilled and tapped hole for the spring screw 68 that secures the spring 69 to the frame 40.

[0017] two holes drilled on the flat plane coil mounting bracket to accept for the screws 64 that secure the coils 60 and 62 (one hole per coil) and a [0018] drilled and tapped hole for the spring screw 68 that secures the rear spring 69 saddle to the frame 40.

[0019] The tube vice mechanism, which is used to attach a tube grip of standard industry measurement to the frame, is located on the front lower portion of the frame. It may include a removable hollow threaded rod to house the compression ferrule, or the hollow threaded section that houses the compression ferrule may be cast or machined as part of the frame.

[0020] If a removable threaded rod is used to house the compression ferrule, an internal taper is machined into the lower front entrance of the threaded rod 14, starting at the outside diameter and machining inwards to a recommended depth of which is optimally 1/8". The entry to the threaded rod 14 is tapered internally to approximately the same degree as the compression ferrule 10 to allow the rod 14 to house the ferrule 10. The threaded rod 14 is optimally attached to the tube vice frame 30 by machining the coil mounting bracket 44 on the frame 40 as follows:

[0021][0021] 1. step-drilling a primary hole measuring $\{\text{fraction}(\text{approximately } 29/64)\}$ " in diameter is step-drilled two-thirds of the way into the front lower section of the coil mounting bracket 44 frame; drilling

2. drilling a secondary hole measuring $\{\text{fraction}(\text{approximately } 5/16)\}$ " or $\{\text{fraction}(\text{approximately } 11/64)\}$ " in diameter is drilled through the remaining one-third of the frame coil mounting bracket 44, using the same center point as the previous hole.

X [0023] The primary ~~{fraction (29/64)}~~" hole is optimally tapped with a 1/2 20 bottoming tap from the entrance of the hole, starting at the ~~bottom-front~~ of the coil mounting bracket 44 and continuing through to the end of the step -drilling (approximately two-thirds of the way into the coil mounting bracket 44).

NM [0024] [0024] The threaded rod 14 is screwed into the threaded hole (not shown) and optimally protrudes approximately a 1/2" from the front of the frame coil mounting bracket 44.

[0024.1] In a variation to the preferred embodiment, the removable hollow threaded rod 14 may be cast or machined as part of the coil mounting bracket 44 on the frame 40, rather than as a removable component.

NM [0025] [0025] If the hollow threaded ~~section~~ rod 14 is cast as part of the frame 40, it optimally protrudes approximately a 1/2" from the bottom-front of the frame coil mounting bracket 44 (the same length as the threaded rod 14, described above, would protrude once screwed into the frame coil mounting bracket 44). If the frame 40 is cut on a CNC mill, the hollow threaded ~~section~~ rod 14 may also be machined into the frame 40, protruding approximately 1/2" from the bottom of the frame 40. ~~(again, the same length as the threaded rod or cast threaded section would protrude from the frame).~~ The same taper, preferably machined to a (recommended depth of 1/8") applies should be used whether a removable threaded rod 14 is used to house the compression ferrule 10 or the threaded ~~rod 14~~ section is cast or machined as part of the frame 40.

NM [0026] [0026] The compression ferrule 10 is preferably ~~usually~~ made of a flexible or

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malleable material (often such as brass). The exterior surface of the preferably brass compression ferrule 10 is tapered on both ends; and with the tapers meeting in the middle of the ferrule 10. A slit is made vertically through half of the ferrule 10 to allow flexibility when it is compressed and tightened around the tube 20 ~~grip~~. The compression ferrule 10 is placed into the hollow section of the threaded rod 14 or machined frame component 14.

[0027] ~~{0027}~~ The compression nut 12 is step drilled, drilled, and tapered to the same specifications as the threaded rod 14. It may be machined from any type of metal. The nut 12 is has interior threads adapted to be screwed onto the threaded rod 14 or threaded section 14 of the frame 14 40 that houses the compression ferrule 10 with by turning the nut 12 in a tightening clockwise motion to secure the tube ~~grip~~ 20, or unscrewed conversely turning the nut 12 in an anti-clockwise direction ~~loosening motion~~ to release the tube 20 ~~grip~~.

[0028] ~~{0028}~~ Referring now to Figure 3, a pre-assembly side detail view of a compression nut 12, ferrule 10 and threaded rod 14 is shown. The arrows indicate the direction of connection of the nut 12 to the rod 14. The tapered lip of the interior surface of the rod 14 serves to compress the ferrule 10 thereby reducing the interior diameter of the ferrule 10.

[0028.1] Figure 4 shows an assembled side detail view of a compression nut, ferrule and threaded rod. The compressed ferrule abuts the tube 20 with its interior surface, thereby securing the ferrule 10 in place without bending, crimping or other damage to the tube 20. Function

UM { [0028.2] In use, the sterilized, removable components are assembled as follows: the hollow rod 14 is screwed clockwise into the coil mounting bracket 44 on the frame 40, then the needle bar 24 is inserted through the frame 40 and attached to the armature bar 70. The tube 20 then slides over the active or distal end of the needle bar 24 and into the frame 40. The ferrule 10 slides over the tube 20 to seat against the distal end of the rod 14 and is tightened clockwise to compress the ferrule 10 against the tube 20 thereby retaining it in the frame 40. The tube grip 16 slides over the tube 20, and is secured by at least one set screw 26. The tube tip 18 is then inserted inside the distal end of the tube grip 16 and over the needle bar 24, and is secured to the tube grip 16 by at least one set screw 26.

[0029] ~~[0029]~~ When the compression nut 12 is turned clockwise in a tightening motion, the bevels or tapers make contact and slide over each other, creating pressure evenly around the circumference of the taper on the compression ferrule 10 and causing it to compress. The vertical slit in the ferrule 10 provides greater room a gap for compression as the ends of the slit move toward each other, creating a squeezing effect and securing the tube 20 grip to the frame 40 without bending or crimping it.-

[0030] ~~[0030]~~ After use of the tattoo machine 100, Turning the compression nut 12 is rotated counter-clockwise in a loosening motion to relieve the pressure on the compression ferrule 10, resulting in the release of the tube 20 grip. The motion is easy to perform and avoids damage to the tube 20 which commonly occurs in prior art tattoo machines 100. The present invention is a streamlined apparatus due to the low profile, inline ferrule 10, rod, 14 and nut 12 arrangement.

[0030.1] The preferred embodiment and variations herein described are not intended to be exhaustive or to limit the scope of the invention to the precise forms disclosed. They are chosen and described to best explain the principles of the invention and its application and practical use to allow others skilled in the art to comprehend its teachings.

[0030.2] As will be apparent to those skilled in the art in the light of the foregoing disclosure, many alterations and modifications are possible in the practice of this invention without departing from the spirit or scope thereof. Accordingly, the scope of the invention is to be construed in accordance with the substance defined by the following claims.

WHAT IS CLAIMED IS:

~~1. ————What we claim as our invention is the screw tight tube vice frame as shown in FIG. 2, including the cast or machined frame made of metal or other material, drilled and tapped where necessary; and the tube vice mechanism, which consists of the threaded rod or threaded frame section, compression ferrule, and compression nut.~~

1. (amended)1. In an apparatus for a tattoo machine comprising at least one reciprocating needle, a housing surrounding said needle, and a frame, a means of securing said housing to said frame comprising:

- (a) a nut;
- (b) a ferrule; and
- (c) a receiving piece.

2. (new)The apparatus of Claim 1 wherein said housing is inserted in said receiving piece, said ferrule encircles said tube, abuts said receiving piece, and is adapted to compress, thereby retaining said housing as said nut is tightened onto said receiving piece.

3. (new) The apparatus of Claim 2 wherein said receiving piece is a removable hollow rod having threads on its external surface adapted to receive threads disposed on the internal surface of said nut.

4. (new) The apparatus of Claim 2 wherein said receiving piece is a tapped hole in said frame.

5. (new) The apparatus of Claim 3 wherein said ferrule is a split ring with an external surface which tapers down from a central highpoint to the outer edges of said ferrule.
6. (new) The apparatus of Claim 5 wherein said ferrule is metal.
7. (new) The apparatus of Claim 6 wherein said metal is one of brass, aluminum, steel, or iron.
8. (new) The apparatus of Claim 5 wherein said ferrule is compressible thereby reducing the interior diameter of said ferrule.
9. (new) A tube vice frame apparatus in a tattoo machine comprising:
- (a) a hollow threaded cylinder extending from a frame;
 - (b) a split ferrule tapered at both ends removably abutting the interior surface of said cylinder;
 - (c) a tube passing through said cylinder and extending towards the active end of said tattoo machine and disposed about a needle bar adapted to reciprocate within said tube; and
 - (d) a compression nut removably tightened against said ferrule and said cylinder such that said ferrule is compressed thereby retaining said tube in place.

10. (new) The apparatus of Claim 9 wherein said cylinder is a hollow rod removable screwed into said frame.
11. (new) The apparatus of Claim 9 wherein said threaded cylinder is integral to said frame.
12. (new) A modular tube vice frame kit for tattoo machines comprising a hollow threaded cylinder, a split ring with beveled ends and a nut adapted to screw onto said cylinder thereby compressing said split ring to grip a tube adapted to house at least one needle.
13. (new) A method of manufacturing a screw tight tube vice frame in a tattoo machine comprising the steps of:
- (a) drilling an internal taper into a hollow rod and cutting threads onto the exterior surface of said rod;
 - (b) drilling a first hole into a tattoo machine frame;
 - (c) drilling a second hole of a smaller diameter than said first hole through the remaining portion of said frame using the same centerline as said first hole, such that there is a transverse hole in said frame;
 - (d) tapping said first hole;
 - (e) screwing said rod into said first hole such that said rod protrudes from said frame;
 - (f) machining a split ring ferrule with tapered ends of an angle equivalent to said taper of said rod;

(g) providing a nut adapted to screw onto said rod with said ferrule between said rod and said nut such that said ferrule may be compressed by said nut to retain objects disposed within said ferrule.

14. (new) The method of Claim 13 wherein said frame is cast.

15. (new) The method of Claim 13 wherein said frame is cut using a computer controlled mill.

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ABSTRACT

An apparatus and a method for manufacturing the apparatus is disclosed for a tattoo machine frame with a screw tight tube vice for attaching a needle housing or tube to the frame of a tattoo machine which facilitates cleaning and sterilization.. The apparatus, or tube vice, comprises a tube which houses On all modern tattoo machines, the tube grip is a removable part that houses the needle bar, which holds the the a needle needle groupings that which moves into and out of the subject's skin in the act of during tattooing, a hollow cylinder which may be removable or integral to the frame of the tattoo machine, a split ring ferrule and a compression nut. The tube is inserted into the hollow cylinder and the ferrule slides over the tube to abut the interior of the hollow cylinder. Both the ferrule, nut and the interior of the hollow cylinder have beveled edges that match which mate. The nut slides over the tube to screw into the hollow cylinder thereby compressing the ferrule against the tube without bending or crimping the tube as generally occurs with the prior art. A The tube grip may be attached to the tube. The components of the tattoo machine are thereby rendered easy to remove and reassemble. and needle groupings must be removable to allow for cleaning and sterilization. The tattoo machine is also streamlined and less prone to parts puncturing protective coverings than prior art machines. A method of manufacturing the tube vice is also disclosed. The tube vice can be provided in kit format. This invention is intended to improve the technology currently used by tattoo machines to secure the tube grip to the tattoo machine frame. Existing tube vice technology uses methods of securing the tube grip to the tattoo machine frame that tend to bend or crimp the tube grip. The Screw Tight Tube Vice Frame uses tube vice technology that secures the tube grip in place just as securely as or more securely than existing technology, but will not bend or crimp the tube grip. It includes a frame with holes drilled and tapped for attaching it to other components of a tattoo machine and a tube vice mechanism for attaching the tube grip to the frame. The tube vice mechanism allows the tube grip to be secured to the tattoo machine frame with a simple twist, and released with a counter twist.